

BREADER FOR COATING EDIBLE FOOD PRODUCTS WITH FRESH BREAD CRUMBS

BACKGROUND OF THE INVENTION

This invention relates to a breeding apparatus for applying edible fresh bread crumbs or a variety of other coating materials to surface coat food products. More particularly, the breeder of the invention allows a uniform coating of a breeding material such as fresh bread crumbs to surface coat a solid core of food which has first been coated with a liquid batter.

In the field of large scale food preparation and processing, batter coating and breeding processes are conventionally utilized for a variety of food products which are to be cooked by deep fat frying. Such food products usually comprise sea foods, poultry, red meats and vegetables, but a variety of other food products may also be desirably batter coated and breaded to provide an aesthetically appealing food product. Apparatus are available for batter coating such food products wherein common batters are made from corn and/or wheat flours, starches, seasonings and gums plus an amount of water, which are mixed in various proportions as desired by the food processor. Similarly, coating materials come in a variety of different forms, but may be a dry breeding formulation of grain, flours, seasonings and spices, or ground cereal, dried vegetables or other coating materials. Various particular types of breeding materials may comprise common bread crumbs in a granular form, wherein the granules are 1/16th of an inch or less in major dimension and may be termed a "flour" breeding material. Such granular bread crumbs are usually termed "free flowing" because they will not pack into clumps, nor will they self-bridge over an opening slightly larger than the granules. Another type of bread crumb is referred to as "Japanese style" breeding material or J-crumb breeding which comprise material in larger granular form wherein the integrity of the granular form is desired to be maintained, and the bread crumbs have physical characteristics such that they may pack into clumps or self-bridge over openings.

More recently, it has been desirable in the field of large scale food processing, to use what is referred to in the art as "fresh bread" crumbs which are made from fresh bread and create unique problems in attempting to coat food products in a machine breeding application. In contrast to the "dry formulation" of common bread crumbs mentioned above, the "fresh bread" crumbs usually have a substantial moisture content, and thus require that the bread crumb coating apparatus be more gentle in its distribution of the bread crumbs within the breeding machine as well as in the application of the crumbs to the food product to be coated. If the bread crumb apparatus operates too harshly upon fresh bread crumbs, the individual crumbs have a tendency to combine together to form doughballs which are undesirable as a crumb coating for food products and also creates significant problems in the operation of the machine. The particle sizes of fresh bread crumbs are generally larger and the crumbs are somewhat pliable as compared to typical dry bread crumbs or the J-crumb breeding material. For this reason, the breeding apparatus must also be gentle in its distribution and coating so as to prevent the crumbs from being ground into smaller granular form within the apparatus.

In the assignees U.S. Pat. No. 4,936,248, a breeder for coating edible food products with fresh bread crumbs was described to enable complete and continuous coating of battered food products which are carried on a moving conveyor belt. The breeding machine as described included bread crumb distribution apparatus which was operable to more gently process "fresh bread" crumbs. This breeder creates a bottom layer of breeding which is formed on a moving product conveyor belt onto which battered food product pieces to be breaded are placed. The moving belt then carries the product under a falling curtain of bread crumbs which covers the top and sides of the product pieces. The apparatus includes a drum type conveyor and associated belt conveyors which are operable to provide the top and side coating of "fresh bread" crumbs or other breeding material to the food products on the product conveyor. The drum type conveyor enables the fresh bread crumb material to be lifted for disposition on the upper surfaces of food products in a gentle manner so as to avoid any appreciable deterioration to the breeding material in the distribution to the upper surfaces of the food product.

Although the breeder as described in this prior patent enabled handling of fresh bread crumb material with significantly better results, various problems were encountered in proper distribution of the breeding material. For example, due to the physical characteristics of the fresh bread crumb material, some degradation or deterioration of the breeding material was still found to be evident in use for large scale food processing and preparation. Additionally, because of the moisture content of the fresh bread crumb material, it was found that the breeding material became congested and may have had a tendency to pack thereby disabling proper distribution of the breeding material within the apparatus. It was further found that proper distribution of the breeding material upon initial start-up and subsequent addition of breeding material did not provide for immediate and even distribution within the apparatus.

Various other breeding machines are shown in prior assignees U.S. Pat. Nos. 3,547,075 and 4,128,160, wherein a bottom layer of breeding is formed on a moving product conveyor belt onto which battered food products may be disposed to provide a bottom layer of breeding material thereon. A top layer of breeding material is then made to fall on the food products as they pass through the apparatus on the product conveyor belt, after which a series of pressure rollers may be made to press upon the top layer of bread crumbs for retention of the breeding material on the food product. Excess bread crumbs are then removed, generally with vibrators and/or air curtains, and the coated and breaded food product is discharged from the breeding machine. Again, although these breeding machines may be sufficient for certain types of breeding materials, they may not satisfactorily or adequately process and distribute "fresh bread" type breeding material for proper application to food products without appreciable deterioration of the breeding material.

SUMMARY OF THE INVENTION

Based upon the foregoing, there is found to be a need to provide a breeder for coating edible food products with fresh bread crumbs which will avoid deficiencies found in prior art breeders. It is therefore a main object of the invention to provide a breeder for coating edible food products with fresh bread crumbs or other bread-